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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,723	07/23/2001	Mark A. Lauer	LAUM-004	5523

24501 7590 04/13/2006

MARK A LAUER
6601 KOLL CENTER PARKWAY
SUITE 245
PLEASANTON, CA 94566

EXAMINER	
KLIMOWICZ, WILLIAM JOSEPH	
ART UNIT	**PAPER NUMBER**
2627	

DATE MAILED: 04/13/2006

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/912,723
Filing Date: July 23, 2001
Appellant(s): LAUER, MARK A.

Mark Lauer
For Appellant

EXAMINER'S ANSWER

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

This is in response to the appeal brief filed December 12, 2005 appealing from the Office action mailed July 6, 2005.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 23, 26 and 29 have been cancelled in an Amendment filed February 28, 2006, the Amendment having been entered by the Examiner.

Thus, as it currently stands, claims 1-4, 6-14, 17-22, 24, 25, 27 and 28 are currently pending and the subject of the Appellant's current Appeal.

(4) Status of Amendments After Final

The amendment after final rejection filed on February 28, 2006, in which claims 23, 26 and 29 were cancelled by the Appellant, has been entered.

The amendment after final rejection filed on September 9, 2005 was denied entry by the Examiner.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

Grounds (1) and (2) as set forth in the Appeal Brief have been vacated in view of the Appellant canceling claims 23, 26 and 29 in the Amendment filed on February 28, 2006, and now entered.

Additionally, the following rejections have been vacated:

The remaining Grounds of Rejection (3) through (9) to be reviewed on Appeal remain, except for the rejections enumerated by Roman numerals, *infra.*

(I) Rejections and/or arguments previously made concerning claims 23, 26 and 29 have been deemed moot to due Appellant's cancellation of said claims.

(II) Claims 22 and 28 previously rejected under 35 U.S.C. §102(b) as being anticipated by Harada et al. (JP 9-035230 A), have been vacated as for lack of evidential support, as it pertains to anticipation under statute 35 USC §102 only.

(III) Claims 3, 13 and 25 previously rejected under 35 U.S.C. §103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, have been vacated as for lack of evidential support, as it pertains to obviousness under statute 35 USC §103, with the aforementioned references only.

(IV) Claims 21 and 27 previously rejected under 35 U.S.C. §103(a) as being unpatentable over Harada et al. (JP 9-035230 A) have been vacated as being superfluous, and not based on Appellant's arguments and/or lack of evidence.

(V) Claim 24 previously rejected under 35 U.S.C. §103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380,

published February 1, 1993, has been vacated as being superfluous, and not based on Appellant's arguments and/or lack of evidence.

(VI) Claims 22 and 28 previously rejected under 35 U.S.C. §102(b) as being anticipated by Tokuyama et al. (US 5,757,573) have been vacated as for lack of evidential support, as it pertains to anticipation under statute 35 §USC 102 only.

(VII) Claim 25 previously rejected under 35 U.S.C. §103(a) as being unpatentable over Tokuyama et al. (US 5,757,573) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, has been vacated as for lack of evidential support, as it pertains to obviousness under statute 35 USC §103, with the aforementioned references only.

(7) Claims Appendix

A correct copy of appealed claims appears on pages 42-47 of the Appendix to the Appellant's brief.

It is noted that Claims 23, 26 and 29, however, have been cancelled in an Amendment filed on February 28, 2006, and entered by the Examiner.

(8) Evidence Relied Upon

5,757,573	**TOKUYAMA**	**5-1998**
JP 09-035230	**HARADA et al.**	**2-1997**
JP 06-176517	**ENDO**	**6-1994**
JP 09-148639	**FUKUOKA**	**6-1997**

IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380 **2-1993**

Claim Status

Claims 1-4, 6-14 and 17-22, 24, 25, 27 and 28 are currently pending and the subject of the Appeal filed on December 12, 2005, supplemented by the Appellant's amendment filed on February 28, 2006, canceling claims 23, 26 and 29; thus, claims 5, 15 and 16, previously cancelled, join claims 23, 26 and 29 as claims which have been voluntarily cancelled by the Appellant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7-10, 20, 21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Harada et al. (JP 9-035230 A).

As per claims 1 and 20, Harada et al. (JP 9-035230 A) discloses a device for reading or writing information (see FIG. 1 - disk drive), the device comprising: an electromagnetic transducer (magnetic head 1, which includes electromagnetic transducing element - solid layers of an electromagnetic induction element 11 and magnetoresistive element 12 - see paragraph [0029] of previously enclosed English machine translation or enclosed copy of full English translation as obtained from the Translation Offices of the USPTO) including a plurality of solid transducer layers (e.g., the layers of the induction head (11) and/or the layers of the magnetoresistive head (12)), a substrate (e.g., slider (2) and unitary integral flexures (3, 3)) adjoining said transducer (1), said substrate (2, 3) shaped as a rigid body (slider portion which directly adjoins the transducer (1)) adjacent to said transducer (1) and as a plurality of flexible elements (3) distal to said transducer (1) (e.g., see FIGS. 3, 4 and 5), and an actuator - actuation means as per claim 20 (e.g., portion of load arm between elements (7) which magnetically interacts with (7) to rotationally position the slider (2) to a selected track of the disc (6)) attached

(i.e., fastened or secured or joined to) to said substrate (2 including flexing elements (3)) distal to said transducer (1) (via (4) and/or (5)). Note the Examiner has interpreted the term "attached" as encompassing non-direct contact. For example, two objects can be considered as being "attached" (or for that matter "joined" or "secured" or "fastened") to each other by an intervening element, such as resin or glue bonding the two objects together, without requiring direct contact between the two objects.

As per claim 7, wherein said rigid body (2) has a media-facing-surface (e.g., see FIG. 2) separated from a back surface (e.g., upper surface of (2) on which (4) resides - see FIG. 3) in a Z-direction, and at least a portion of said flexible elements (3) is disposed at a Z-height between said surfaces (e.g., see FIG. 3 wherein the lowermost surface of (3) is indeed between the media facing surface of (2) and its uppermost surface).

As per claim 8, wherein said flexible elements (3) are aligned ***substantially*** with a plane, and said rigid body (2) and said actuator are intersected by said plane (see FIG. 2).

As per claim 9, wherein said rigid body (2) has a media-facing-surface (surface of (2) closest to disk (6)) separated from a back surface (back surface of (2) which is contacted by (4)), and said back surface has a protrusion extending away from said media-facing surface (e.g., portion of (21) which rises through and above (2) to form portion (4), which is in a plane above [thus a protrusion] above the back surface of (2) as seen in FIG. 3).

As per claim 10, wherein at least one of said flexible elements (3) contains a plurality of conductive leads (4) - see FIG. 4.

As per claim 21 and 27 (and also claim 24, rejected *infra*), wherein said flexible elements extend substantially parallel to a first plane (e.g., the plane in which the elements (3) lie) and said

transducer layers are substantially parallel to a second plane that is perpendicular to said first plane. Note that the actual "transducing" performed by the head of Harada et al. (JP 9-035230 A) is at the pole tips and fringing gap located proximate designator (113) in FIG. 3, and that these nearly vertical pole tip layers are substantially (although not quite) vertical in FIG. 3. Thus, clearly it can be said that the "transducing layers" are substantially parallel to a second plane that is perpendicular to the plane encompassing the flexures (3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 4, 11, 12, 14, 17, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993.

See the discussion of Harada et al. (JP 9-035230 A), *supra.*

As per claim 14, see the discussion of claim 8, *supra.*

As per claim 17, see the discussion of claim 9, *supra.*

As per claim 24, see the discussion of claims 21 and 27, *supra.*

With regard to claims 2, 4, 11 and 12, Harada et al. (JP 9-035230 A) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrostrictive actuator as per claim 11).

Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed by Harada et al. (JP 9-035230 A)) are well known in the art, however.

As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230 A), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/**layers** (i.e., an electrostrictive actuator) (piezo layer A and layer B = **layers**) formed as part of a piezoelectric actuator, in lieu of the conventional type rotary actuator. The IBM TDB uses such a piezoelectric actuator in lieu of the conventional actuator in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Additionally, as per claim 19, wherein the actuator of the IBM TDB includes means ("certain voltage applied to the piezo(s)"- see description of the IBM TDB), for providing electrical voltage to said piezoelectric (i.e., electrostrictive) actuator.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the

conventional actuator disclosed by Harada et al. (JP 9-035230 A) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of Endo (JP 06-176517 A).

See the discussion of Harada et al. (JP 9-035230 A), *supra.*

With regard to claim 6, Harada et al. (JP 9-035230 A) does not explicitly show wherein the flexures of the suspension are substantially aligned with a center of mass of said rigid body (i.e., the slider).

Endo (JP 06-176517 A), however, disclose wherein a support suspension portion of the flexure end of a suspension is absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body), in order to, *inter alia*, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A)..

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the teaching of a suspension end flexure support provided as being substantially aligned

with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) and IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, as applied to claim 11 above, and further in view of Fukuoka (JP 09-148639 A).

See the descriptions of Harada et al. (JP 9-035230 A) and the IBM TDB, *supra*.

As per claim 18, the IBM TDB, as applied to Harada et al. (JP 9-035230 A), remains silent with respect to the composition of the piezoelectric actuator as containing a material including silicon. Note that the slider of Harada et al. (JP 9-035230 A) is indeed formed of silicon as per claim 18.

It is well known, however, that piezoelectric actuators of the type disclosed by the IBM TDB wherein the actuator includes a silicon composition are well known.

As just one specific example, Fukuoka (JP 09-148639 A) discloses a piezoelectric actuator wherein portions thereof include compounds of silicon so as to "prevent deformation of an inner electrode" of a piezoelectric actuator.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the IBM TDB as applied to Harada et al. (JP 9-

035230 A), as including a compound of silicon as is known, as exemplified and suggested by Fukuoka (JP 09-148639 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide piezoelectric actuator of the IBM TDB as applied to Harada et al. (JP 9-035230 A), as including a compound of silicon as is known, as exemplified and suggested by Fukuoka (JP 09-148639 A) in order to, *inter alia*, prevent deformation of an electrode of a conventional piezoelectric actuator as explicitly suggested in the manner disclosed by Fukuoka (JP 09-148639 A).

Claims 21 and 27 are rejected under 35 U.S.C. §102(b) as being anticipated by Tokuyama et al. (US 5,757,573).

As per claims 1 and 20, which are inherently incorporated into claims 21 and 27, which depend respectively therefrom, Tokuyama et al. (US 5,757,573) discloses a device (e.g., FIG. 1) for reading or writing information (to a disk (1)), the device comprising an electromagnetic transducer (2) including a plurality of solid transducer layers (as is necessarily required), a substrate (30) - see, *inter alia*, COL. 12, lines 52-63- adjoining said transducer, said substrate (30) shaped as a rigid body (portion of slider that is the air bearing and is not flexed as seen, e.g., in FIGS. 5 and/or 6 and/or 7 and/or 23 and/or 24, etc) adjacent to said transducer (2) and as a plurality of flexible elements (plurally divided portions of (30) which flexes as seen, e.g., in FIGS. 23, 24, etc.) distal to said transducer (2), and an actuator (12) (actuation means as per claim 20) attached to said substrate (30) distal to said transducer (2).

As per claim 21 and 27, wherein said flexible elements (each individual flexed finger holding a head) extend substantially parallel to a first plane and said transducer layers (e.g., see vertical-to-air-bearing-surface orientation in FIGS. 22 and 23) are substantially parallel to a second plane that is perpendicular to said first plane.

Claims 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuyama et al. (US 5,757,573) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993.

See the discussion of Tokuyama et al. (US 5,757,573), *supra.*

As per claim 24, see the discussion of claims 21 and 27 with respect to Tokuyama et al. (US 5,757,573), *supra.*

With regard to claim 11 (which is the base claim of newly presented rejected claims 24-26), Tokuyama et al. (US 5,757,573) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrostrictive actuator as per claim 11).

Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed by Tokuyama et al. (US 5,757,573)) are well known in the art, however.

As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses an actuator used in an analogous type of disk drive as that of Tokuyama et al. (US 5,757,573), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/layers (i.e., an electrostrictive actuator) formed as

part of a piezoelectric actuator, in lieu of the conventional type actuator. The IBM TDB uses such a piezoelectric actuator in lieu of the conventional actuator in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Tokuyama et al. (US 5,757,573).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Tokuyama et al. (US 5,757,573) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

(10) Response to Argument

Appellant's arguments filed December 12, 2005 have been fully considered but they are not persuasive.

At the outset, the Examiner notes that the decision handed down in a Federal Circuit Appeal (CAFC), *International Rectifier Corp. v. IXYS Corp.* 02-1414,-154 on March 18, 2004, is the manner in which the Examiner has and will interpret the definition of the term "adjoining."

In this CAFC decision, a factually similar situation was raised as it pertained to the term "adjoining." See, e.g., page 16 through page 18 of the full text decision, appended to the a Communication mailed April 21, 2004.

The CAFC effectively stated that the term "adjoining" was to be interpreted as "contacting."

As such, the Examiner had previously reopened prosecution in this application based on the interpretation given to the meaning of "adjoining" as being in direct "contact" and informed the Appellant as such, in no uncertain terms.

It is noted that the Appellant ***has had ample opportunity*** to modify the term "adjoining," but has ***not*** exercised this ***option*** to do so.

As such, the Examiner's interpretation given to the meaning of "adjoining" is as being in direct "contact" as per the factually similar aforementioned CAFC case.

The Appellant alleges that Harada et al. (JP 9-035230 A) is somehow "nonenabled." See page 16 of the Appeal Brief filed December 12, 2005.

The Examiner vigorously disagrees with the Appellant's allegation, and the Examiner maintains that Harada et al. (JP 9-035230 A) clearly and without question would enable one of ordinary skill in the art to practice the disclosure of Harada et al. (JP 9-035230 A).

The Appellant refers to statements contained in a English-machine translation, which of course, cannot be taken at full-face value, since as the ordinary layperson familiar with receiving such machine translations, would appreciate that while the machine translation may include some English language ambiguities and non sequiturs, the Examiner was still able to glean the gist of the disclosure of Harada et al. (JP 9-035230 A), when viewed in conjunction with the unambiguous English abstract and drawings contained therein. As noted by the Appellant, the machine-translated copy of unequivocally states, "[t]his document has been translated by

computer. So the translation may not reflect the original precisely." The Examiner further maintains that the English-language abstract of Harada et al. (JP 9-035230 A) coupled with the drawings, alone, would be readily understood by one having ordinary skill in the art at the time of Harada et al. (JP 9-035230 A) publication. The machine-translation merely added to the abstract.

Moreover still, a full English-language translation of the Japanese document (non-machine translation) fully supports what the Examiner has been maintaining all along, and factually undermines the Appellant's position, which ostensibly is that a machine-translation of Harada et al. (JP 9-035230 A) renders the document as being "nonenabled."

The Appellant maintains that Harada et al. (JP 9-035230 A) fails to disclose "a plurality of solid transducer layers of the induction head (11) and/or layers of the magnetoresistive head (12)." See page 18-19 of the Appeal Brief filed December 12, 2005.

The Examiner maintains that Harada et al. (JP 9-035230 A) does indeed disclose "a plurality of solid transducer layers of the induction head (11) and/or layers of the magnetoresistive head (12)." The Examiner points to the English-machine language translation at paragraph [0029], which clearly references that the head comprises an "electromagnetic-induction head" and a "magneto-resistive effect head." Further evidence can be found at paragraph [0029] of the English-translation as provided for by the Patent Office STIC library.

Once again, the Appellant's arguments have been proven to be meritless, based on the facts as clearly evidenced by Harada et al. (JP 9-035230 A).

At page 19 of the Appeal Brief, the Appellant alleges that Harada et al. (JP 9-035230 A) fails to disclose an actuator in which the arm of Harada et al. (JP 9-035230 A) connects to the actuator.

The Examiner, once again, vigorously disagrees with the Appellant.

Harada et al. (JP 9-035230 A) factually discloses a "positioning actuator" designated schematically at (7) - see paragraph [0024] of the English-translation as provided for by the Patent Office STIC library.

As is well known to one having ordinary skill in the art, the positioning actuator is a device which uses energy to provide controllable motion, to position the head radially/linearly on a disk, e.g., disk (6) of Harada. The generic schematic of the actuator depicted in Figure 1 of Harada et al. (JP 9-035230 A) is what is known in the art as a VCM radial positioning actuator, wherein the actuator positions the head radially along an arc of motion.

More concretely, the depiction within Figure 1 of Harada et al. (JP 9-035230 A) is the conventional schematic of a voice-coil motor (VCM) positioning actuator, wherein an energized voice coil actuator is *directly* fixed to the arm of an actuator, and via the Lorentz force ($\mathbf{F} = q\mathbf{v} \times \mathbf{B}$), interacts with a stationary magnetic field, to provide motion to the arm (in this case, arm (5) of Harada et al. (JP 9-035230 A)). Note, for the Lorentz, **F** designates the amount of force, and is a vector quantity; q designates the amount of charge (electrons) and is a scalar quantity, **v** represents the directional (vector) velocity of the charge(s) and **B** designates the magnetic field vector. The generic block depiction of (7) in Figure 2 of Harada et al. (JP 9-035230 A) is referencing that stationary field magnets of the voice coil actuator, which are located above and below the coil that must be affixed to the arm in order for the actuator to move, as one of

ordinary skill in the art would necessarily be knowledgeable of and as further, one of ordinary skill in the art would readily recognize.

In some instances, the magnet is the actuator, and is fixed directly to an actuator arm being movable therewith, and the coil is stationary above it.

In any event, for ***any*** actuator (SMA, piezoelectric, etc) to cause movement, an actuator component must absolutely be attached to a body in order to cause the body to move. If the Appellant can submit evidence that would defy the laws of physics, and provide a showing wherein no component of an actuator is attached to a rotatable body to cause it to move, which causes radially movement of a head, that would then mysteriously cause motion of the arm, the Examiner will reconsider the 102 rejection, and modify it accordingly.

The Examiner maintains that the conventional VCM positioning actuator disclosed Harada et al. (JP 9-035230 A) clearly must provide a component that provides energy, and which is attached to the actuator arm, and that such component is necessarily present as described, *supra*, and would be recognized by persons of ordinary skill at the time of publication of Harada et al. (JP 9-035230 A).

The Appellant at page 20 of the Brief, alleges that the Examiner "does not even attempt to show that the structure corresponding to the 'means for' clause in claim 20," i.e., "actuation means for positioning said transducer. It is noted further that claim 20 further recites, "said actuation means attached to said substrate ***distal to said transducer***." Emphasis in bold italics added.

The Examiner maintains that claim 20 is generic in the sense that it reads on more than one disclosed embodiment of the Appellant's disclosure. Even the Appellant admitted for the

record that claim 20 was indeed generic. In response to a Species restriction requirement, filed on May 6, 2003, the Appellant clearly and unambiguously states for the record, "Claims 1, 11 and 20 are generic." The Examiner maintains that this includes the embodiment of Figure 2, wherein, although there is no depicted actuator located adjacent the transducer, an actuator must be indeed be ***distally located from the transducer***. Additionally, one type of actuator that is ***referred to in the Appellant's specification*** is at paragraph [0004], which sets forth "conventional actuator" (e.g., as conventional VCM actuator). This is the structure that the Examiner maintains corresponds to the "actuation means for positioning said transducer ...said actuation means attached to said substrate ***distal to said transducer*** which reads on Harada et al. (JP 9-035230 A). Emphasis in bold italics added.

In *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc.* (54 USPQ2d 1185) (CAFC 2000), it was held that a means-plus-function claim element could indeed include corresponding structure described by prior art structures disclosed in the specification, stating:

> In construing the disputed claim limitations, it must be kept in mind that the claims at issue in this case are combination claims. Combination clams can consist of new combinations of old elements or combinations of new and old elements. See *Intel Corp. v. U.S. Int'l Trade Comm.*, 946 F.2d 821, 842, 20 USPQ2d 1161, 1179 (Fed. Cir. 1991), *Panduit Corp. v. Dennison Mfg.*, 810 F.2d 1561, 1575, 1 USPQ2d 1593, 1603 (Fed. Cir. 1987). Because old elements are part of these combination claims, claim limitations may, and often do, read on the prior art. *See id.* Clearly, the written description does point out the disadvantages of the rigid-conduit system and the advantages of the flexible-hose system. However, the written description does not require that only the new, flexible-hose system, but not the old, rigid-conduit system, could be used in the claimed wastewater treatment plant. It is well established in patent law that a claim may consist of all old elements, such as the rigid-conduit system, for it may be that the combinations of the old elements is novel and patentable. Similarly, it is well established that a claim may consist of all old elements and one new element, thereby being patentable. *See id.* Of course, these patent law

> precedents, are based on granted patents, thus, as is often the case, patent application claims may in fact consistent of old elements, and the combination of old elements in the claims as drafted, is not novel and thereof unpatentable.

Id. at 1189.

Thus, clearly, as based on established patent law and customary accepted practices, the Examiner maintains that the instantly invoked 35 USC §112 sixth paragraph claim limitation, does not in any way preclude a reading on the prior art, inclusive of the Appellant's admitted prior art, since the Appellant's instant alleged invention is not solely drawn to the "actuation means," but is further alleged to include a slider substrate shaped as a rigid body and flexible elements, which may, or may not, be used in combination with the actuation means, including disclosed prior art "actuation means," as exemplified in other embodiments of the Appellant's disclosure.

It is further telling that the Appellant has not in any manner, through argument or claim modification, identified the structure, material, or acts described in the Appellant's specification as corresponding to each claimed function set forth by the Appellant.

The Appellant alleges as it pertains to the rejection of claim 8, at page 21 of the Brief:

> Appellant respectfully asserts that it appears from drawing 5 of Harada that "gimbal 3" may be aligned substantially with a plane, but that "slider 2"' is not intersected by that plane. For at least this reason, the Final Rejection has failed to present *prima facie* case of anticipation of claim 8.

The Examiner disagrees based on the facts as evidenced by Harada et al. (JP 9-035230 A). More concretely, as per claim 8, the flexible elements (3) are aligned ***substantially*** with a

plane, and the rigid body (2) interests the plane of the gimbals. As seen in Figure 3, for instance, the top of slider (2) lies in a common plane with the gimbal arms located on both sides of the slider. Additionally, the actuator that is necessarily required to be attached to the arm for the arm to be able to move, also must lie substantially within this plane, or at the very least, ***substantially*** within this plane.

The Appellant alleges as it pertains to the rejection of claim 9, at page 21 of the Brief:

> Appellant respectfully asserts that it appears from drawings 2 and 3 of Harada that "slider 2" does not have a "media-facing-surface"' as alleged by the Final Rejection, but is instead covered by "magnetic head 1." For at least this reason, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 9. In addition, because "slider 2"' does not have a "media-facing-surface," a protrusion cannot rise from a nonexistent "media-facing-surface."' For this reason also, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 9.

The Examiner again disagrees based on the facts as evidenced by Harada et al. (JP 9-035230 A).

As per claim 9, Harada et al. (JP 9-035230 A) discloses wherein the rigid body (2) has a media-facing-surface (surface of (2) closest to disk (6)) separated from a back surface (back surface of (2) which is contacted by (4)), and said back surface has a protrusion extending away from said media-facing surface (e.g., portion of (21) which rises through and above (2) to form portion (4), which is in a plane above [thus a protrusion] above the back surface of (2) as seen in FIG. 3).

Although magnetic head (1) does indeed cover the media-facing surface of the slider (2), the slider (2) nevertheless has a surface which is parallel to and faces the disk (6). It is just an

unexposed face. If Appellant's were to be believed, a Halloween-mask-wearing trick-or-treater would be void of a face behind the mask.

Moreover still, the Appellant's own specification, discloses an intervening member layer between the head surface and the media it faces.

As set forth in paragraph [0050] of Appellant's specification:

> A protective coating of diamond-like carbon (DLC), tetrahedral amorphous carbon (ta-C), silicon carbide (SiC) or the like may then be formed on the rails **48**, **49**, pad **50**, gimbal **35** and flexure **38**. For the situation in which such a protective coating was formed over the media-facing surface prior to defining pads **48**, **49** and **50**, the head **33** may not be coated again.

That is, a coating member is formed on the media facing surfaces of the substrate and magnetic head transducers, which comprise the rigid body as a whole. Is the Appellant now implying that a slider which has *any* additional layer or coating covering the media-facing surface of said slider, precluded in *any* way from being within the scope of the claimed invention? The Examiner, based on the plain language of the claim viewed in light of the corresponding specification, believes that such a slider would indeed be covered by the scope of claim 9, and if such is the case, must also provide that Harada et al. (JP 9-035230 A) anticipates claim 9.

Moreover still, the Examiner maintains that the rigid body as set forth in the claims does not in any way preclude said rigid body from being two integral members directly contacting and fixed to each other, i.e., the rigid body of the Appellant's disclosure includes both the wafer substrate and the head formed thereon.

As set forth in the Appellant's own disclosure at paragraph [0041], "[a] media-facing surface **46** of the head **33** includes rails **48** and **49** and a transducer-containing pad **50**."

Further, as set forth in the Appellant's own disclosure at paragraph [0045]:

> In FIG. 3 some initial steps in forming the head **33** are shown. The head **33** is ***formed on a wafer substrate 100***, also shown in FIG. 4, that may be made of alumina (Al_2O_3), alumina titanium carbide (Al_2O_3-TiC), silicon (Si), silicon dioxide (SiO2), silicon carbide (SiC) or other known materials, the head being mass-produced along with hundreds or thousands of other heads.

Emphasis in bold and bold underlined italics added.

That is to say, the magnetic head of the Appellant's device is an element separate from, but formed on the slider, in very much the same way that the magnetic head (1) of Harada et al. (JP 9-035230 A) is a separate element from, but formed directly on and contacting the slider (2).

Thus, the "rigid body" of the Appellant's own disclosure clearly evidences that the magnetic head, being formed directly thereon and integral therewith, encompasses both the substrate and the magnetic head.

That is, the rigid body includes the head, *per se*, and the magnetic head surface of the surface and the substrate body; both have surfaces which face the media.

Moreover to the main point, however, clearly, claim 9 does not in any way require the face to be an "exposed" face. The Examiner maintains that the Appellant's remarks are not commensurate with the invention as claimed. Therefore, limitations contained therein cannot be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 386 F.2d 924, 155 USPQ 687 (CCPA 1968).

The Appellant alleges as it pertains to the rejection of claims 21, 24 and 27, at page 22 bridging page 23 of the Brief:

> As noted above, Harada is not enabled to teach "flexible elements (3)"' because it is not possible to reconcile drawings 2 and 3 with drawings 4 and 5, although each is said by Harada to represent the same "1st example." For

> example, the "sectional view"' of drawing 3 shows "gimbal 3" connected to "slider 2,"' yet the "perspective view" of the same example in drawings 4 and 5 instead shows a space between "gimbal 3" and "slider 2," for any lengthwise cross-section that intersects "head 1." For at least this reason Harada is nonenabled and cannot be used as prior art to show a "flexible element 3" having any orientation relative to the "transducer layers" alleged by the Final rejection.
>
> In addition, Harada does not teach, and it would not have been evident to one of ordinary skill in the art, how to make the "transducer layers" alleged by the Final rejection. Appellant respectfully asserts that one of ordinary skill in the art could not explain, with reference to support in Harada, exactly how the unconventional "head 1" of Harada would be made. In particular, how are the layers adjacent to "gap 113" that are asserted by the Examiner to be "substantially vertical" made to terminate at the corner of "head 1" adjacent to vertical and horizontal edges of "head 1" as shown in FIG. 3? Paragraph [0030] of Harada teaches that "the magnetic head of the planar method installed in parallel with the flat surface," implying that the "head 1" is built in layers that are parallel to layer 112, exacerbating the difficulty in explaining the construction of the layers that terminate adjacent "gap 113."
>
> For at least these reasons, the Final Rejection has failed to present a *prima facie* case of anticipation of claims 21, 24 or 27.

The Examiner notes that, for the reasons explained above, Harada et al. (JP 9-035230 A) is clearly and unquestionably enabled. The Examiner notes that the references need not show every single detail of the disclosure, but to merely describe to a person of ordinary skill in the art, a disclosure which would enable one of ordinary skill in the art to practice the invention of the disclosure without undue experimentation.

Additionally, as per claim 21, 24 and 27, Harada et al. (JP 9-035230 A) discloses that the flexible elements (3) extend substantially parallel to a first plane (e.g., the plane in which the elements (3) lie) and the transducer layers are substantially parallel to a second plane that is perpendicular to said first plane. Note that the actual "transducing" performed by the head of Harada et al. (JP 9-035230 A) is at the pole tips and fringing gap located proximate designator (113) in FIG. 3, and that these nearly vertical pole tip layers are substantially (although not quite)

vertical in FIG. 3. Thus, clearly it can be said that the "transducing layers" (i.e., the layers that transduce, and not just merely conduct magnetic flux or shield the coil from flux interaction with the recording medium) are substantially parallel to a second plane that is perpendicular to the plane encompassing the flexures (3).

Moreover ***still***, the Appellant's attention is directed to the embodiment of Figure 9 of Harada et al. (JP 9-035230 A), wherein the head and its associated layers are orientated perpendicular to the disk, as contrasted with the head (1) of embodiments disclosed in Figures 2, 3, 6 and 8.

The Appellant alleges as it pertains to the rejection of claims 22, 25 and 28, at page 22 bridging page 23 of the Brief have been deemed moot, since claims 22 and 28 previously rejected under 35 U.S.C. 102(b) as being anticipated by Harada et al. (JP 9-035230 A), have been vacated as for lack of evidential support, as it pertains to anticipation under statute 35 USC 102 ***only***. Additionally, claim 25 previously rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, has been vacated as for lack of evidential support, as it pertains to obviousness under statute 35 USC 103, with the aforementioned references ***only***.

As it pertains to the rejection of claims 21 and 27 as being rejected under 35 U.S.C. 102(b), due to anticipation by Tokuyama et al. (US 5,757,573) of the broad claim scope coverage sought by the Appellant, the Appellant state:

> Initially note that the Final Rejection rejected claims 21-23 and 27-29 as allegedly being anticipated by Tokuynma, and begins by discussing claims 1 and

> 20. In a similar manner, appellant's response begins by discussing claims 1 and 20, even though claims 1 and 20 have not been rejected. Also note:
>
> Anticipation under § 102 requires " 'the presence in a single prior art disclosure of all elements of a claimed invention ***arranged as in that claim***.' ", *Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138, 231 U.S.P.Q. (BNA) 644, 646 (Fed. Cir. 1998) (quoting *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1101, 227 U.S.P.Q. (BNA) 337, 350 (Fed. Cir. 1985)) (additional citations omitted). (emphasis added).

See page 24 of the Appeal Brief filed December 12, 2005.

At the outset, the Examiner notes that claims 22 and 28 previously rejected under 35 U.S.C. 102(b) as being anticipated by Tokuyama et al. (US 5,757,573) have been vacated as for lack of evidential support, as it pertains to anticipation under statute 35 USC 102 ***only***.

It is unclear what the Appellant is alleging that the Examiner isn't showing in the rejected claims. The reason the Examiner did not overtly reject independent claims 1 and 20 in the statement of the rejection of claims 21 and 27 under 35 U.S.C. 102(b), due to anticipation by Tokuyama et al. (US 5,757,573), is quite simple.

The Appellant filed an amendment on May 16, 2005, wherein all pending claims were not amended, but then introduced new dependent claims 21-29.

In order for the Examiner to make the rejection FINAL, without introducing a new grounds of rejection as it applied solely to unamended independent claims 1 and 20 filed on May 16, 2005 by the Appellant, the Examiner was precluded from overtly rejecting a non-amended claim, but since the dependent claims 21 and 27 were newly presented, the Examiner could reject these claims on new art without opening a "new" ground of rejection, as it pertained to the newly presented claims.

Since, as is well known and established, dependent claims are just a short-handed way to write a claim incorporating all the limitations of the referenced claim without having to rewrite the claim from which it depends over again (saving space and time), claims are allowed to be written in dependent form.

The Examiner's discussion of independent claims 1 and 20 in the body of the rejection of claims 21 and 27 as being rejected under 35 U.S.C. 102(b), due to anticipation by Tokuyama et al. (US 5,757,573), is merely to provide support that Tokuyama et al. (US 5,757,573) does indeed disclose the requisite limitations of the dependent claims, including incorporated limitations of their respective independent claims.

As it pertain to the limitations incorporated by reference (claim 1) into the dependent claims 21 and 27 (note that claims 23 and 29 have since been canceled in an Amendment filed by the Appellants on February 28, 2006), the Appellants state:

> Regarding claim 1, appellant respectfully disagrees with the Examiner that Tokuynma discloses "an actuator (12) . . . attached to said substrate (30) distal to said transducer (2)." Appellant respectfully asserts that "actuator 12" is not attached to "support 3"" or "suspension 30."

See page 24 of the Appeal Brief filed December 12, 2005.

The Examiner respectfully disagrees based not only on the facts, as evidenced by Tokuyama et al. (US 5,757,573), but the procedure that the Examiners are charged with during *ex parte* prosecution, that is, giving claims their broadest reasonable interpretation.

Tokuyama et al. (US 5,757,573) discloses a device (e.g., FIG. 1) for reading or writing information (to a disk (1)), the device comprising an electromagnetic transducer (2) including a plurality of solid transducer layers (as is necessarily required), a substrate (30) - see, *inter alia*,

COL. 12, lines 52-63- adjoining said transducer. The substrate (30) is ***shaped as a rigid body*** (portion of slider that is the air bearing and is not flexed as seen, e.g., in FIGS. 5 and/or 6 and/or 7 and/or 23 and/or 24, etc) adjacent to the transducer (2) and as a plurality of flexible elements (plurally divided portions of (30) which flexes as seen, e.g., in FIGS. 23, 24, etc.) distal to the transducer (2). An actuator (12) (actuation means as per claim 20) is attached to the substrate (30) distal to the transducer (2).

Simply put, if the actuator of Tokuyama et al. (US 5,757,573) was not attached or connected to the substrate (3) as an associated part, how would the transducer move? The actuator is what causes the transducer to expressly, explicitly and functionally move. Although the actuator of Tokuyama et al. (US 5,757,573) may not be touching the substrate, it is nevertheless attached to it, at least indirectly.

The word "attach(ed)" has more than one distinct connotation, but a couple of the primary commonly accepted meanings include "(1) To fasten on or affix to: connect or join" and "(2) To connect as an adjunct or associated part." Webster's II New College Dictionary, 1995. As such, "attach(ed)" clearly does not require direct contact or contact connection. Appellant does not point to anything in the specification that the invention requires that the actuator be directly in contact to the substrate. Is the Appellant implying that ***any*** intermediate layer, coating or connecting member intervening between the actuator and the substrate, such that the substrate and the actuator are not directly contacting or touching each other, be precluded from the scope of the invention as defined within the instant claims? The Examiner does not feel so, otherwise the Appellant would have readily modified his claim language to say as much.

The Examiner therefore considers the scope of the limitations as found within claims 1 and 20, and incorporated into claims 21 and 27, with respect to the recitations "actuator ... attached to said substrate" to include structures as shown in Figures of Tokuyama et al. (US 5,757,573). Claims are to be given their broadest reasonable interpretation during prosecution. See *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969).

Moreover still, the actuator could further be interpreted as being the rotor actuator (5) which receives energy to provide controlled motion to the heads to lift the heads up or down on the disk. Even assuming arguendo that the actuator (12) is not connected to the heads distally to cause the heads to radially move, then without question, the rotor actuator (5) which additionally causes the heads to move in an up and down manner ***is touching and contacting rigid member*** (4), which is a part of the rigid body comprising (3) and (4) *in toto*.

As it pertain to the limitations incorporated by reference (claim 20) into the dependent claims 21 and 27 (note that claims 23 and 29 have since been canceled in an Amendment filed by the Appellants on February 28, 2006), the Appellant states:

> Claim 20 in part recites "actuation means for positioning said transducer." Appellant respectfully asserts that "actuation means 12" does not teach the structure disclosed in appellant's specification corresponding to the "means-plus-function" clause in claim 20. Instead, actuator 12 of Tokuyama appears to be a conventional rotary actuator. In addition, appellant respectfully asserts that "actuator 12'" as shown in FIG. 1 is not attached to "support 3" or "suspension 30."

See page 24-25 of the Appeal Brief filed December 12, 2005.

The Examiner maintains that claim 20 is generic in the sense that it reads on more than one disclosed embodiment of the Appellant's disclosure. The Examiner maintains that this includes the embodiment of Figure 2, wherein, although there is no depicted actuator located adjacent the transducer, an actuator must be indeed ***distally*** located from the transducer.

Additionally, one type of actuator that is ***referred to in the Appellant's specification*** is at paragraph [0004], which sets forth "conventional actuator" (e.g., as conventional VCM actuator). This is the structure that the Examiner maintains corresponds to the "actuation means for positioning said transducer ...said actuation means attached to said substrate ***distal to said transducer*** which reads on Harada et al. (JP 9-035230 A). Emphasis in bold italics added.

Moreover still, the Appellant's attention is directed to another embodiment of Tokuyama et al. (US 5,757,573) which discloses a piezoelectric actuator mounted in synthetic layer (32) for causing actuation movement of the substrate.

It is further telling that the Appellant has not in any manner, through argument or claim modification, identified the structure, material, or acts described in the Appellant's specification as corresponding to each claimed function set forth by the Appellant.

Appellant also states that Tokuyama et al. (US 5,757,573) fails to disclose a "plurality of solid transducer layers" as set forth in the limitations of claims 1 and 20, which are incorporated into dependent claims 21 and 27, stating:

> Regarding both claims 1 and 20, appellant respectfully disagrees with the Final Rejection statement that Tokuynma discloses "a plurality of solid transducer layers (as is necessarily required)" As noted on page 4 of appellant's Request for Reconsideration filed December 3, 2003, a transducer can be formed with an iron core mounted on the trailing end of a slider. Moreover, as stated on page 4 of that Request for Reconsideration:
>
> A horseshoe magnet wound with a coil of wire will operate as suggested by the Final Rejection, and only includes a single

> layer. Moreover, perpendicular recording does not require more than one pole layer, although often a return pole layer is included. For example, U.S. Patent No. 4,286,299 to Shirahata et al. teaches that a magnetic head may have a single magnetic core layer around which is wrapped a winding carrying the recording current for vertical magnetization.

See page 25 of the Appeal Brief filed December 12, 2005.

The Examiner maintains that Tokuyama et al. (US 5,757,573) does indeed necessarily disclose two or more solid layers, which are required for magnetic transducing. Although the schematic of Tokuyama et al. (US 5,757,573) clearly infers a conventional inductive thin film magnetic head, assuming arguendo that the heads of Tokuyama et al. (US 5,757,573) are indeed a "ring-type" old-fashioned head of the 1960's or earlier, not used anymore in the type of head fabrication utilized in Tokuyama et al. (US 5,757,573), a ring head must have two pole layers and a fringing gap. The Appellant may then argue, "wait, the two pole layers are connected at their back gap and thus form a single u-shaped ring." "True indeed," the Examiner would respond to such a hypothetical question, but so too are the thin-film heads formed of two layers and mechanically touching at their respective back-gap via, as is known by those in the art, effectively creating a thin-film version of a u-shaped ring.

Is the Appellant implying that ***any*** connection at the back gap of a head of the current invention, be precluded from the scope of the invention as defined within the instant claims? The Examiner does not feel so, otherwise the Appellant would have readily modified his claim language and drawings to disclose as much. Had the Appellant taken the much simpler path and merely modified the claim language to read "said transducer being formed as a thin-film head," this clearly would preclude any reading of rings heads. Of course, had the Appellant made such

an amendment, the Examiner would have changed the rejection from a rejection under 35 USC 102 to a rejection under 35 USC 103 with the corresponding additional reference showing such a ubiquitous thin-film head.

With regard to the showing of Shirahata as cited by the Appellant - see page 25 of the Appeal Brief filed December 12, 2005 -, the Examiner maintains that Shirahata shows at least two magnetic layers, one being a magnetoresistive element (7) and the other being another magnetic layer, auxiliary head (5), disposed on the other side of a flexible medium.

Note that Tokuyama et al. (US 5,757,573) relates to a hard disk drive, not a magnetic or floppy drive. Note further that even the head of Shirahata does indeed require the at least two layers of magnetic material in order to transduce information (on both sides of a magnetic tape).

Note further that Tokuyama et al. (US 5,757,573) discloses a coil layer (which generates magnetic flux), in association with two legs transducing layers of a core as readily seen in FIG. 34 of Tokuyama et al. (US 5,757,573), wherein the flux generated by the coil layer (200) flows through the tip end of one core leg at the transducing junction, to the other core leg, after interacting with the magnetic medium. To require just one magnetic layer in a transducer, with no other layer for the magnetic flux to close back on itself, involves the theoretical existence of magnetic monopoles. To date, although theoretically a few magnetic monopoles are thought to exist in the vast universe, they have not been found anywhere in the vicinity of planet Earth, let alone structured to provide a single pole magnetic head, wherein the flux does not close back on itself.

As per the rejections of claims 2-4, 11-14, 17, 19, 24 and 25 under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure

Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993.

Claim 25 was previously rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuyama et al. (US 5,757,573) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, has been vacated as for lack of evidential support, as it applies to the cited references **only**.

The Appellant alleges that the IBM TDB is nonenabled, averring:

> Like Harada, the IBM TDB cited by the Final Rejection is nonenabled, albeit for different reasons. One problem with the IBM TDB is the requirement that, in order to use "piezo A" to move the "head" as alleged in lines 27-34 of page 1 and shown by arrow "A" of Fig. 1, the "stage" structure surrounding "piezo B" must be free to rotate about the "pivot," and "piezo B" must also be free to rotate. Therefore, expansion of "piezo B" would not, in this case, move the "head" as shown by arrow "B"' of Fig. 1.
>
> Similarly, to move the "head" by "piezo B" as shown by arrow "B" of Fig. 1, "piezo A" and the arms and other structure surrounding "piezo A" must be free to move. In this case, instead of moving the "head" as alleged in lines 27-34 of page 1 and shown by arrow "A" of Fig. 1, "piezo A" and the arms and other structure surrounding "piezo A" would be expected to move. It is at best unclear how such an inherent conflict between "piezo A" and "piezo B" would be resolved. Thus, one of ordinary skill in the art would expect the IBM TDB to provide some unknown and unpredictable amount of actuation to the head, thwarting the actuator's essential purpose pf accessing specific tracks on the medium.
>
> Note further that the "long stroke movement" of IBM TDB is stated to be achieved by mechanical multiplication of the piezoelectric movement by a factor of one thousand (p. 1, ll. 35-38). In other words, any error or inaccuracy in the long stroke actuator of the IBM TDB is multiplied by a factor of one thousand at the head, likely leading to intolerable errors. Even so, this "long stroke movement" only achieves a range of one centimeter (p. 1, ll. 37-38), requiring at least two such long stroke actuators (along with additional actuators, suspensions and heads) for even the small disk surface shown.
>
> Compounding this problem is the realization, as discussed above, that the "fine movement" alleged to be provided by "piezo B" is incompatible with the "long stroke movement" alleged to be provided by "piezo A." Note that even the

"fine movement" actuation would multiply errors by a factor of twenty (p. 1, ll. 36-37), and that both "fine movement" and "long stroke movement" would multiply the unpredictable actuation discussed above.

Moreover, it is unclear how the limited long stroke actuation described in the IBM TDB would even allow the disk drive depicted in Fig. 2 of that disclosure to be fabricated. For example, while it may be possible for the head and suspension designed for interaction with the outer zone ("ZONE - 2") of the disk to be moved beyond the circumference of the disk to allow drive fabrication, this would presumably require even greater mechanical multiplication and greater errors. On the other hand, it is not at all clear how the head and suspension designed for interaction with the inner zone ("ZONE -1") of the disk could be moved beyond the circumference of the disk during fabrication, as this would seem to require more than double the limited range of actuation provided.

In addition, the IBM TDB does not disclose, and it would not have been evident to one of ordinary skill in the art, how to write on and read from the other major surface of the disk of that disclosure. Note that at least an additional pair of heads and suspensions would be needed for this essential feature of a modern disk drive, and each head and suspension would require an additional pair of actuators. Cramming the additional actuators on the same side of the disk as the actuators that are shown would seem to interfere with the additional heads and suspensions that would need to be located on that side of the disk. Reducing the size of the actuators in order to avoid such interference is contradicted by the meager large stroke motion allegedly provided by the actuators shown, which require mechanical multiplication of one thousand times in order to provide movement that, as discussed above, is still inadequate. In addition, attempts to reduce the actuator size would require greater mechanical multiplication and create even more errors.

Attempting to provide additional actuators on the opposite side of the disk from the actuators shown would exacerbate these difficulties. Placing the actuators in the corners directly across from the actuators shown would destroy the ability of all the original heads and suspensions as well as all the additional heads and suspensions to function, as the suspensions on each side would need to be in the same place as the actuators on the other side. On the other hand, placing the actuators in the corners across and ninety degrees from the actuators shown would destroy the functioning of both the original heads and suspensions designed for accessing the outer zone and the additional heads and suspensions designed for accessing the outer zone, as the outer heads and suspensions on each side would need to be in the same place as the actuators on the other side.

In addition, the inability of the head and suspension designed for interaction with the inner zone of the disk to be moved beyond the circumference of the disk during fabrication, as mentioned above, would make fabrication intractable should such an inner zone head and suspension be required for the other surface of the disk. For at least the above reasons, the IBM TDB is nonenabled and is therefore not prior art that can be used in an obviousness

> rejection. It is easy to see why the IBM TDB was apparently not considered worthy of a patent application, despite the large numbers of patents issued in disk drive art to IBM.
>
> The Final Rejection on page 18 responds to the argument that the IBM TDB is nonenabled by simply claiming, albeit "strenuously," that the IBM TDB is enabled. The Final Rejection, however, offers no answer to the various reasons that were detailed by appellant in the prior response explaining why the IBM TDB would be recognized as unworkable by one of ordinary skill in the art.

See pages 28-30 of the Appeal Brief filed December 12, 2005.

The Examiner maintains that the Appellant is completely off base regarding the alleged non-enabled disclosure of the IBM TDB. The Appellant apparently cannot fathom how one would construct such a disk drive as disclosed by the IBM TDB, since the actuator arms, can move only so far.

The construction of the IBM TDB can be simply achieved by first building the piezo actuators on the base of the drive, then placing the disk over a spindle, and then attaching the arms to the pivot structure that rises above the respective disk. This is of course, is just one method of construction in an absolute multitude of methods for which would simply be of little or no amount of undue experimentation (or thought for that matter) in building the disk drive as disclosed by the IBM TDB.

Additionally, it is unclear as what the Appellant cannot, or simply refuses to understand about the drive as disclosed by the IBM TDB.

More concretely, the IBM TDB provides for a piezoelectric actuator. The actuator operates with two piezo elements; one for long stroke movement (e.g., to position a head among various tracks of a disk surface) and the other for fine movement (e.g., after finding the correct

track, maintaining the head over the desired track by a conventional servo operation, which provides feedback to the piezo B).

In Figure 1 of the IBM TDB, two piezo elements are used. One is designated as piezo A for long stroke movement (a macro-actuator as is known in the art). The other is designated as piezo B is for fine movement (e.g., a type of track-following micro-actuator as is known in the art).

When a certain voltage is applied to the piezo A, it expands and pushes the arms. The tip of the right arm then moves to right direction and that of the left arm to left direction. These movements are then transferred to torque around the pivot and cause rotation of the stage, to which the actuator B is affixed. The suspension fixed on the stage rotates around the pivot in accordance with stage movement producing the requisite large stroke movement. At the tip of the suspension the head is attached. Long stroke of the head is thus achieved by the piezo A. The displacement of the piezo element is expanded by 1000 times the slight displacement of the piezo element A (10 microns) such that the suspension rotations result in a 10mm (about ½ inch) stroke of the head is achieved on the 1.8 inch diameter disk.

The piezo B is used for a fine movement and used for track following during read/write after a particular track is accessed by the macro-actuator of piezo A, of course, as one of ordinary skill in the art would appreciate, without giving too much thought, let alone any undue experimentation. The piezo B would expand, providing only a slight torque on the arms about the pivot, to micro or fine tune the positioning of the head, without needing any energization of piezo A during the track following operation.

As is depicted in Figure 2, another embodiment is provided in which there are two actuators used. The top actuator could be used for moving the head over ZONE-1, while the other actuator can be used for moving its associated head over ZONE-2.

The device disclosed by the IBM TDB bulletin is simple to understand and construct. While reading the IBM TDB bulletin, one admittedly cannot expressly determine the particular errors associated with such a disclosure, however minor and completely undue experimentation could tweak the device to operate in its disclosed fashion after its construction. The Examiner is completely perplexed by the Appellant's assertion of alleged "nonenablement." It is noted however, that the Appellant's are entitled to draft their claims as broad as they desire, even if it some are unpatentable, as they are able to argue the moon is made of cheese.

The Appellant alleges that that one of ordinary skill in the art would not have modified Harada with the IBM TDB, giving various reasons - see pp. 30-34 of the Appeal Brief filed December 12, 2005.

The Examiner again disagrees with the Appellant's allegations.

More concretely, the Examiner maintains that one of ordinary skill in the art would have been motivated to combine the features of IBM TDB to Harada (or vice versa) for the express and explicit advantages espoused by each. For example, with regard to claims 2, 4, 11 and 12, Harada et al. (JP 9-035230 A) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrostrictive actuator as per claim 11).

Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed by Harada et al. (JP 9-035230 A); piezo electric materials, in order to function, must have at least one layer of piezo material (e.g., lead zirconate titinate - PZT, with another electrode layer disposed on at least one side, and another electrode layer (THIRD layer of piezo device) in order to create the requisite electric field and generate the movement of the piezo element in the electric field) are well known in the art, however.

As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230 A), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/layers (i.e., an electrostrictive actuator having at least two electrode layers and a piezo material) formed as part of a piezoelectric actuator, in lieu of the conventional type rotary actuator. The IBM TDB uses such a piezoelectric actuator ***in lieu of the conventional actuator*** in order to, *inter alia*, ***reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.***

Thus given the clear advantages espoused by the IBM TDB, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

The Examiner thus maintains that a *prima facie* has been established.

The legal concept of *prima facie* obviousness is a procedural mechanism. It allocates who has the burden of going forward with production of evidence in each step of the examination process. *In re Piasecki,* 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

An Examiner bears the initial burden of presenting a *prima facie* conclusion of obviousness. *Id.* at 1472, 223 USPQ at 788. A *prima facie* case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. *In re Rinehart,* 531 F.2d 1048, 1051. 189 USPQ 143, 147 (CCPA 1976). If the Examiner does not make a *prima facie* case, an Appellant is under no obligation to submit evidence of nonobviousness. *In re Oetiker,* 977 F.2d 1443. 1445, 24 USPQ2d 1443. 1444 (Fed. Cir. 1992).

An Examiner has established a *prima facie* case of obviousness by meeting three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp,* 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

The Examiner has set forth that one having ordinary skill in the pertinent art at the time the invention was made, would have been motivated to provide the piezo actuator of the IBM

TDB to be used in conjunction with the head device of Harada, in the manner set forth in claims 2, 4, 11, 12, 14, 17, 19 and 24 under 35 U.S.C. 103(a) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Second, there must be a reasonable expectation of success. In view of the prior art (i.e., the IBM TDB) suggesting the desirability of providing a piezoelectric actuator in lieu of a conventional VCM actuator, a modification of Harada to achieve the benefits derived from such a piezoelectric actuator would be *reasonably* expected to provide similar results within the analogous disk drive structure of the IBM TDB.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As articulated in the rejection, *supra*, the combination of the IBM TDB as applied to Harada results in a structure that teaches or suggests all limitations of the claimed invention.

Once the Examiner does produce a *prima facie* case, the burden of going forward with evidence shifts to the Appellant. *Piasecki,* 745 F.2d at 1471-72, 223 USPQ at 788. The Applicant (prior to the close of prosecution) may submit additional evidence of nonobviousness, e.g., comparative test data showing that the claimed invention possesses improved properties not expected by the prior art.

After evidence or argument is submitted by the Applicant in response to the *prima facie* case, the Examiner must "start over." *Rinehart*, 531 F.2d at 1052, 189 USPQ at 147. The

Examiner is charged with determining patentability on the totality of the record by a preponderance of evidence with due consideration to the persuasiveness of any arguments and additional evidence. *Oetiker,* 977 F.2d at 1445, 24 USPQ2d at 1444.

After careful consideration of the Appellant's arguments, and the totality of the record by a *preponderance* of the evidence, the Examiner has maintained the rejection of claims, as set forth, *supra.*

Additionally, the Appellant argues continually that with regard to IBM TDB, "it is unclear whether the IBM TDB "piezo elements" include layers ... Part of this confusion may stem from the nonenabled IBM TDB'S failure to provide any conductors for the "piezo elements." See, e.g., arguments to individual claims at pp. 31-34 of Brief.

The Examiner maintains that the IBM TDB discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230 A), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/**layers** (i.e., an electrostrictive actuator), wherein piezo layer A and piezo layer B, collectively, constitute the piezo **layers,** formed as part of a piezoelectric actuator, *in toto*, in lieu of the conventional type rotary actuator.

Absolutely nothing in the rejected claim language requires the piezo layers to be "compatible", or for that matter, even touching or contiguous.

With regard to the rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of Endo (JP 06-176517 A), the Appellant alleges:

> Appellant respectfully disagrees with the Final Rejection assertion that 'it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada, as explicitly taught and suggested by Endo (JP 06-176517 A). Initially note that the Final Rejection does not even assert a case of obviousness of claim 6, instead alleging that it "would have been obvious . .. to provide the teaching of. . ." Perhaps this is because Endo involves a suspension that is fitted into a groove of the slider whereas Harada claims to have gimbals that are located to the side of the slider, and there is no evident way to reconcile these opposite approaches. As mentioned above, the Final Rejection provides no suggestion as to how providing the teaching of Endo would accomplish the device defined in claim 6.

See page 35 of the Appeal Brief filed December 12, 2005.

The Examiner respectfully disagrees based on the facts as evidenced by the disclosures of Harada and Endo, taken with the expressly suggestive teachings of Endo as applied to Harada.

More concretely, with regard to claim 6, Harada et al. (JP 9-035230 A) does not explicitly show wherein the flexures of the suspension are substantially aligned with a center of mass of said rigid body (i.e., the slider).

Endo (JP 06-176517 A), however, disclose wherein a support suspension portion of the flexure end of a suspension is absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body), in order to, *inter alia*, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

Given the express suggestions of Endo, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of

Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A), i.e., by simply shifting the flexures of Harada adjacent the middle of the slider mass, to further provide stable support as taught by Endo.

That is, one of ordinary skill in the art would have been motivated to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

The Examiner relies upon Endo for the teaching of a providing a support suspension portion of the flexure end of a suspension as being absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body).

The Examiner further maintains that it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of providing a support suspension portion of the flexure end of a suspension that is absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body) as taught by Endo to the integral slider and flexure assembly of Harada in order to, *inter alia*, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

The Examiner maintains that the test for obviousness is not whether the features of one reference may be bodily incorporated into the other to produce the claimed subject matter, but simply what the combination of references makes obvious to one of ordinary skill in the art.

More specifically, the Examiner is not relying the flexure of Endo to be structurally incorporated into a groove of the slider of Harada, but the teaching by Endo that providing a support suspension portion of the flexure end of a suspension that can be absorbed into the slider (i.e., rigid body) thickness and thus adjacent to the center of mass of the slider (i.e., rigid body) reduces thickness and stabilizes the slider and its support structure; this teaching could readily be accomplished in Harada by merely offsetting the integral flexures on a side of the slider, i.e., absorbing the flexure into its z-height thickness to provide stable slider support and reduced overall thickness.

As has been held in *In re Bozek*, 163 USPQ 545 (CCPA 1969), the test for obviousness is not whether the features of one reference may be bodily incorporated into the other to produce the claimed subject matter, but simply what the combination of references makes obvious to one having ordinary skill in the pertinent at. See also *In re Mapelsden*, 51 CCPA 1123, 329 F.2d 321, 141 USPQ 30 (1964); *In re Henley*, 44 CCPA 701, 239 F.2d 3, 112 USPQ 56 (1956); *In re Richman*, 165 USPQ 509 (CCPA 1970); *In re Van Beckum*, 169 USPQ 47 (CCPA 1971) and also *In re Sneed*, 710 F.2d 1544, 218 USPQ 385 (Fed. Cir. 1983).

As it pertains to the rejection of claim 18 under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) and IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380,

published February 1, 1993, as applied to claim 11 above, and further in view of Fukuoka (JP 09-148639 A), the Appellant states:

> As discussed above, both Harada and the IBM TDB are nonenabled and provide disincentives rather than motivation to make the combination proposed in the Final rejection. Fukuoka (JP 09-148639 A; "Fukuoka") teaches prevention of deformation of an inner electrode layer by adding silicon nitride (p. 1, ll. 15-18). The IBM TDB, however, does not mention an electrode or teach where an electrode is to be located, and so it is at best unclear that deformation of an electrode would be a problem. Instead, because the IBM TDB requires deformation of "piezo A'" and the arms and other structure surrounding "piezo A," one of ordinary skill in the art would not have modified the proposedly combined Harada and the IBM TDB with Fukuoka as proposed by the Final Rejection.

See page 36-37 of the Appeal Brief filed December 12, 2005.

As set forth above, the Examiner maintains firstly, that both Harada and the IBM TDB are enabled; secondly, that the IBM TDB which uses a piezoelectric actuator must include at a minimum three layers, two electrode layers to generate the requisite electric field - similar to the electric field generated by a capacitor sandwiching a dielectric layer - and would be necessarily recognized by one having ordinary skill in the art to have the minimal three layers; and thirdly, that as per claim 18, although the IBM TDB, as applied to Harada et al. (JP 9-035230 A), remains silent with respect to the composition of the piezoelectric actuator as containing a material including silicon (note that the slider of Harada et al. (JP 9-035230 A) is indeed formed of silicon as per claim 18), it is well known, however, that piezoelectric actuators of the type disclosed by the IBM TDB wherein the actuator includes a silicon composition are well known.

As just one specific example, Fukuoka (JP 09-148639 A) discloses a piezoelectric actuator wherein portions thereof include compounds of silicon so as to "prevent deformation of an inner electrode" of a piezoelectric actuator.

Given such an express desirable advantage of using a silicon material in a piezoelectric actuator, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the IBM TDB as applied to Harada et al. (JP 9-035230 A), as including a compound of silicon as is known, as exemplified and suggested by Fukuoka (JP 09-148639 A) in order to, *inter alia*, prevent deformation of an electrode of a conventional piezoelectric actuator as explicitly suggested in the manner disclosed by Fukuoka (JP 09-148639 A).

The Appellant's arguments pertaining to the rejection of claims 21 and 27 previously rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) have been vacated as being superfluous, and not based on Appellant's arguments or lack of securable evidence.

The Appellant's arguments pertaining to the previously rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993, has been vacated as being superfluous, and not based on Appellant's arguments or lack of securable evidence.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Allowable Subject Matter

Claims 3, 13, 22, 25 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

William J. Klimowicz
Primary Patent Examiner
Art Unit 2627

Conferees:

David Ometz
SPE, Art Unit 2622

Wayne Young
SPE, Unit 2627